

Exhibit MM

Exhibit E-14

Invalidity of U.S. Patent No. 7,725,253 (“’253 Patent”)¹ under Pre-AIA Section 102 or Section 103 in view of InterSense IS-900 Precision Motion Tracking System and InterSense IS-900 Studio Camera Tracker (collectively, “InterSense IS-900”)²

InterSense IS-900 was released on August 9, 1999. Plaintiffs belatedly asserted a priority date of June 13, 2001 for the ’253 Patent on December 22, 2021, 71 days after the Court’s deadline. Defendants have reviewed Plaintiffs’ alleged evidence of the purported June 13, 2001 priority date, and maintain that the ’253 Patent is not entitled to this priority date. *See* Defendants’ March 15, 2022 Supplemental Invalidity Contentions. Defendants reserve their objections to Plaintiffs’ belated assertion of the new priority date and expressly reserve all rights to challenge this alleged new priority date. As such, Defendants assume for the sake of these invalidity contentions, that the priority date for the ’253 Patent is August 9, 2002 based on the first filed Provisional Application from which the ’253 Patent claims priority. (Defendants do not concede nor agree that Plaintiffs are even entitled to this date.) Assuming this priority date, InterSense IS-900 qualifies as prior art under at least pre-AIA Sections 102(a) and (b) to the ’253 Patent.

As described herein, the asserted claims of the ’253 Patent are invalid (a) under one or more sections of 35 U.S.C. § 102 as anticipated expressly or inherently by InterSense IS-900 (including the documents incorporated into InterSense IS-900 by reference), and (b) under 35 U.S.C. § 103 as obvious in view of InterSense IS-900 standing alone and, additionally, in combination with the knowledge of one of ordinary skill in the art, and/or other prior art, including but not limited to the prior art identified in Defendants’ Invalidity Contentions and the prior art described in the claim charts attached in Exhibits E-1 – E-23. With respect to the proposed modifications to InterSense IS-900, as of the priority date of the ’253 Patent, such modification would have been obvious to try, an obvious combination of prior art elements according to known

¹ Discovery in this case is ongoing and, accordingly, this invalidity chart is not to be considered final. Defendants have conducted the invalidity analysis herein without having fully undergone claim construction and a *Markman* hearing. By charting the prior art against the claim(s) herein, Defendants are not admitting nor agreeing to Plaintiffs’ interpretation of the claims at issue in this case. Additionally, these charts provide representative examples of portions of the charted references that disclose the indicated limitations under Plaintiffs’ application of the claims; additional portions of these references other than the representative examples provided herein may also disclose the indicated limitation(s) and Defendants contend that the asserted claim(s) are invalid in light of the charted reference(s) as a whole. Defendants reserve the right to rely on additional citations or sources of evidence that also may be applicable, or that may become applicable in light of claim construction, changes in Plaintiffs’ infringement contentions, and/or information obtained during discovery as the case progresses. Further, by submitting these invalidity contentions, Defendants do not waive and hereby expressly reserve their right to raise other invalidity defenses, including but not limited to defenses under Sections 101 and 112. Defendants reserve the right to amend or supplement this claim chart at a later date, including after the Court’s order construing disputed claim terms.

² The claim limitations described herein were disclosed by the InterSense IS-900 as of the earliest priority date of the ’253 patent. For instance: *InterSense Introduces the IS-900 Series of Precision Motion Trackers*, INTERSENSE (Aug. 9, 1999), <https://web.archive.org/web/20010221092911/http://www.isense.com/news/pr/1999/IS900.htm> (“InterSense IS-900 Ex. 1”); *Technical Overview IS-900 Motion Tracking System*, INTERSENSE, <http://www.5dt.com/downloads/3rdparty/IS900TechOverviewEng.pdf> (“InterSense IS-900 Ex. 2”); InterSense IS-900 Systems, INTERSENSE, (earliest revision date Feb. 19, 2004) <https://web.archive.org/web/20040219211135/http://www.isense.com/products/prec/is900/IS900.pdf> (“InterSense IS-900 Ex. 3”); Wormell, et. al, *Unified Camera, Content and Talent Tracking in Digital Television and Movie Production*, NATIONAL ASSOCIATION OF BROADCASTERS SHOW (April 8-13, 2000), https://web.archive.org/web/20060322184144/http://www.isense.com/company/papers/Unified_Studio_Tracking.pdf (“InterSense IS-900 Ex. 4”).

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methods to yield predictable results, a simple substitution of one known element for another to obtain predictable results, a use of known techniques to improve a similar device or method in the same way, an application of a known technique to a known device or method ready for improvement to yield predictable results, a variation of a known work in one field of endeavor for use in either the same field or a different one based on design incentives or other market forces with variations that are predictable to one of ordinary skill in the art, and/or obvious in view of teachings, suggestions, and motivations in the prior art that would have led one of ordinary skill to modify or combine the prior art references.

All cross-references should be understood to include material that is cross-referenced within the cross-reference. Where a particular figure is cited, the citation should be understood to encompass the caption and description of the figure as well as any text relating to or describing the figure. Conversely, where particular text referring to a figure is cited, the citation should be understood to include the figure as well.

A. INDEPENDENT CLAIM 1

CLAIM 1	InterSense IS-900
[1.pre] A tracking system comprising:	<p>At least under Plaintiffs' apparent infringement theory, InterSense IS-900 discloses, either expressly or inherently, a method for tracking an object.</p> <p>No party has yet asserted that the preamble is limiting, nor has the Court construed the preamble as limiting. However, to the extent that the preamble is limiting, it is disclosed by InterSense IS-900.</p> <p>In the alternative, this element would be obvious over InterSense IS-900 in light of the other references disclosed in Defendants' Invalidity Contentions and/or the knowledge of one of ordinary skill in the art.</p> <p><i>See, e.g.:</i></p> <p>The IS-900 product line represents a breakthrough in precision <i>motion tracking</i> for all types of immersive 3D environments. Based on patent-pending Constellation™ technology and proprietary SensorFusion software, the IS-900 series consists of four application specific products that deliver precise and accurate wide-area, interference-free, <i>head, hand and object tracking</i> for the most demanding immersive graphics applications.</p> <p>The IS-900 architecture uses InterSense's SensorFusion software to combine the latest advances in <i>inertial and ultrasonic tracking</i> technology to deliver tracking resolution in the millimeter range for position and below a degree for orientation. Together, the hybrid solution achieves superior performance, resolution and robustness while virtually eliminating the drift, jitter and lag found in other motion tracking systems. The IS-900 features a modular Constellation architecture, which provides unlimited range, intelligent sensor networking for easy expansion and</p>

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CLAIM 1	InterSense IS-900
	<p>ergonomically designed hand-held stylus, joystick and integrated 3D glasses tracker for comfortable, high-performance <i>head and hand tracking</i>.</p> <p>"The IS-900 architecture series delivers the most precise, real-time, multi-point tracking on the market for even the most complex immersive graphics applications," Charlie Miller, president and CEO of InterSense, said.</p> <p>The IS-900 line also offers an easily installed system, auto-calibration hardware and software, and wide software support and backward compatibility with InterSense's present products. From CAVEs™, ImmersaDesks™ and PowerWalls™, to rooms, buildings and production studios, the IS-900 product line provides the ideal precision motion tracking solution for any immersive application.</p> <p>InterSense IS-900 Ex. 1.</p>

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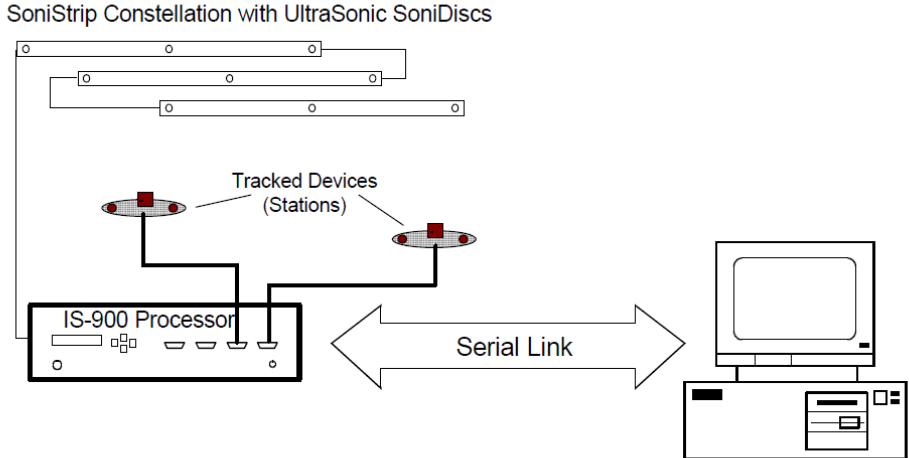

CLAIM 1	InterSense IS-900
	<p>System Components & Configuration</p> <p>Figure 1 illustrates the configuration of the hybrid inertial-acoustic tracking system. The IS-900 hardware is made up of SoniStrips™, Tracked Devices or Stations, and the Processor Unit. The drawing illustrates the IS-900 being used to track two inertial/acoustic devices. The SoniStrip constellation transmits 40 kHz ultrasonic signals that are received by the tracked devices. The inertial component in the tracked station calculates orientation and position updates. The acoustic components prevent drift accumulation to provide full 6-DOF data sent out via an RS-232 connection.</p>  <p style="text-align: center;">Figure 1 – IS-900 HW diagram</p> <p>InterSense IS-900 Ex. 2 at 2.</p>

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CLAIM 1

InterSense IS-900

InterSense IS-900 Systems



Precision 6-DOF Motion Tracking

- *Interference free, wide area motion tracking for:*
 - Simulation and training systems
 - Immersive and Head Mounted Displays
 - CAVE^(tm)s, Power Walls, Reality Centers
 - Visualization Systems
 - Augmented and Mixed Reality Systems
- *Flexible configuration options*
- *Wireless tracked devices*
- *SDK for OEM applications on Windows, Linux and IRIX platforms*
- *Windows software provides simple configuration and network interface*

InterSense IS-900 Ex. 3.

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CLAIM 1	InterSense IS-900
	<p style="text-align: center;">Figure 1 – SoniStrips™</p> <p>To track the camera and its lens information, an integrated tracking head (Figure 2) mounted on a local camera rail system with lens encoders uses a miniaturized inertial sensor (Figure 3) fused in firmware with a set of three ultrasonic receiver modules (URMs).</p>  <p style="text-align: center;">Figure 2 - Inertial/Acoustic Tracking Head</p> <p>InterSense IS-900 Ex. 4 at 2.</p> <p><i>See also</i> Defendants' Invalidity Contentions for further discussion.</p>
[1.a] an estimation subsystem; and	<p>At least under Plaintiffs' apparent infringement theory, InterSense IS-900 discloses, either expressly or inherently, an estimation subsystem. In the alternative, this element would be obvious over InterSense IS-900 in light of the other references disclosed in Defendants' Invalidity Contentions and/or the knowledge of one of ordinary skill in the art.</p>

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CLAIM 1	InterSense IS-900
	<p><i>See, e.g.:</i></p> <p>Brief Introduction & Synopsis of the Operation of the IS-900</p> <p>The InterSense IS-900 Motion Tracking System, commercially introduced in 1999, was developed in conjunction with a Navy SBIR program. To date, there are over 500 IS-900 systems in the field today with the majority of applications found in the military sector (flight simulators, weapon training systems, etc.), industry (oil & gas, automotive) and university research labs.</p> <p>The system is a 6 degree of freedom motion (6-DOF) tracking system based on a hybrid technology of inertia and ultrasonic tracking. The position and orientation of the tracking stations are determined by the output of the accelerometers and gyros. Drift correction is accomplished in our advanced kalman filter by fusing the output of the inertial sensors with range measurements obtained from the ultrasonic components. The result is full 6-DOF data that is very smooth, precise, and free from jitter.</p> <p>InterSense IS-900 Ex. 2 at 1.</p> <p>The tracking head determines the absolute position & orientation of the camera and combines this data with the zoom, focus and iris information for transmission to a rack mounted processor (Figure 4 - IS-900 Base Unit).</p>  <p>Figure 4 - IS-900 SCT Processor</p> <p>InterSense IS-900 Ex. 4 at 2.</p> <p><i>See also</i> Defendants' Invalidity Contentions for further discussion.</p>

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CLAIM 1	InterSense IS-900
<p>[1.b] a sensor subsystem coupled to the estimation subsystem and configured to provide configuration data to the estimation subsystem and to provide measurement information to the estimation subsystem for localizing an object;</p>	<p>At least under Plaintiffs' apparent infringement theory, InterSense IS-900 discloses, either expressly or inherently, a sensor subsystem coupled to the estimation subsystem and configured to provide configuration data to the estimation subsystem and to provide measurement information to the estimation subsystem for localizing an object. In the alternative, this element would be obvious over InterSense IS-900 in light of the other references disclosed in Defendants' Invalidity Contentions and/or the knowledge of one of ordinary skill in the art.</p> <p><i>See, e.g.:</i></p> <p>Brief Introduction & Synopsis of the Operation of the IS-900</p> <p>The InterSense IS-900 Motion Tracking System, commercially introduced in 1999, was developed in conjunction with a Navy SBIR program. To date, there are over 500 IS-900 systems in the field today with the majority of applications found in the military sector (flight simulators, weapon training systems, etc.), industry (oil & gas, automotive) and university research labs.</p> <p>The system is a 6 degree of freedom motion (6-DOF) tracking system based on a hybrid technology of inertia and ultrasonic tracking. The position and orientation of the tracking stations are determined by the output of the accelerometers and gyros. Drift correction is accomplished in our advanced kalman filter by fusing the output of the inertial sensors with range measurements obtained from the ultrasonic components. The result is full 6-DOF data that is very smooth, precise, and free from jitter.</p> <p>InterSense IS-900 Ex. 2 at 1.</p>

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CLAIM 1	InterSense IS-900
	<p>The tracking head determines the absolute position & orientation of the camera and combines this data with the zoom, focus and iris information for transmission to a rack mounted processor (Figure 4 - IS-900 Base Unit).</p>  <p>Figure 4 - IS-900 SCT Processor</p> <p>The processor performs specialized Kalman filtering operations on the tracking data and provides output that is internally or externally synchronized to either standard video rates or any custom rate from under 24 fps up to 180 fps. The data formats and structure in the IS-900 is user programmable through a simple command line or script utility. This feature provides the flexibility needed to match input formats of virtual set software, 3D compositing systems, rendering packages, and real time simulators.</p> <p>InterSense IS-900 Ex. 4 at 2.</p> <p><i>See also</i> Defendants' Invalidity Contentions for further discussion.</p>
[1.c] wherein the estimation subsystem is	At least under Plaintiffs' apparent infringement theory, InterSense IS-900 discloses, either expressly or inherently, wherein the estimation subsystem is configured to update a location estimate for the object based on configuration

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CLAIM 1	InterSense IS-900
<p>configured to update a location estimate for the object based on configuration data and measurement information accepted from the sensor subsystem.</p>	<p>data and measurement information accepted from the sensor subsystem. In the alternative, this element would be obvious over InterSense IS-900 in light of the other references disclosed in Defendants' Invalidity Contentions and/or the knowledge of one of ordinary skill in the art.</p> <p><i>See, e.g.:</i></p> <p>The IS-900 product line represents a breakthrough in precision motion tracking for all types of immersive 3D environments. Based on patent-pending Constellation™ technology and proprietary SensorFusion software, the IS-900 series consists of four application specific products that deliver precise and accurate wide-area, interference-free, head, hand and object tracking for the most demanding immersive graphics applications.</p> <p>The IS-900 architecture uses InterSense's SensorFusion software to combine the latest advances in inertial and ultrasonic tracking technology to deliver tracking resolution in the millimeter range for position and below a degree for orientation. <i>Together, the hybrid solution achieves superior performance, resolution and robustness while virtually eliminating the drift, jitter and lag found in other motion tracking systems.</i> The IS-900 features a modular Constellation architecture, which provides unlimited range, intelligent sensor networking for easy expansion and ergonomically designed hand-held stylus, joystick and integrated 3D glasses tracker for comfortable, high-performance head and hand tracking.</p> <p>"The IS-900 architecture series delivers the most precise, real-time, multi-point tracking on the market for even the most complex immersive graphics applications," Charlie Miller, president and CEO of InterSense, said.</p> <p>The IS-900 line also offers an easily installed system, auto-calibration hardware and software, and wide software support and backward compatibility with InterSense's present products. From CAVEs™, ImmersaDesks™ and PowerWalls™, to rooms, buildings and production studios, the IS-900 product line provides the ideal precision motion tracking solution for any immersive application.</p> <p>InterSense IS-900 Ex. 1.</p>

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CLAIM 1	InterSense IS-900
	<p>The tracking head determines the absolute position & orientation of the camera and combines this data with the zoom, focus and iris information for transmission to a rack mounted processor (Figure 4 - IS-900 Base Unit).</p>  <p>Figure 4 - IS-900 SCT Processor</p> <p>The processor performs specialized Kalman filtering operations on the tracking data and provides output that is internally or externally synchronized to either standard video rates or any custom rate from under 24 fps up to 180 fps. The data formats and structure in the IS-900 is user programmable through a simple command line or script utility. This feature provides the flexibility needed to match input formats of virtual set software, 3D compositing systems, rendering packages, and real time simulators.</p> <p>InterSense IS-900 Ex. 4 at 2.</p>

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CLAIM 1

InterSense IS-900

System Components & Configuration

Figure 1 illustrates the configuration of the hybrid inertial-acoustic tracking system. The IS-900 hardware is made up of SoniStrips™, Tracked Devices or Stations, and the Processor Unit. The drawing illustrates the IS-900 being used to track two inertial/acoustic devices. The SoniStrip constellation transmits 40 kHz ultrasonic signals that are received by the tracked devices. The inertial component in the tracked station calculates orientation and position updates. The acoustic components prevent drift accumulation to provide full 6-DOF data sent out via an RS-232 connection.

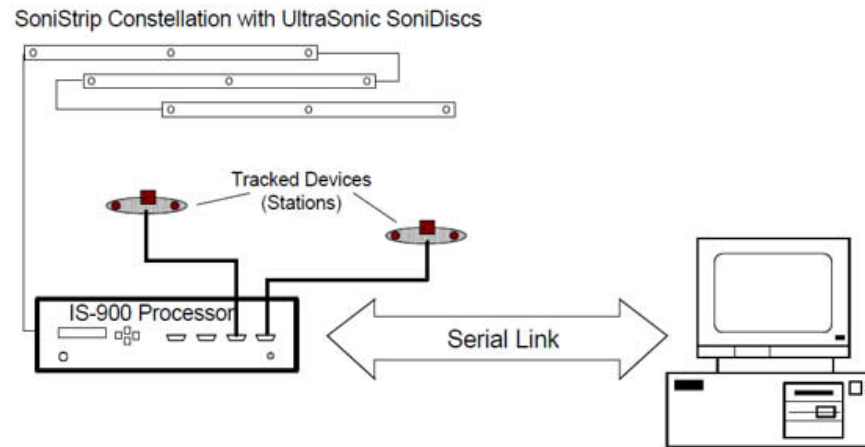



Figure 1 – IS-900 HW diagram

InterSense IS-900 Ex. 2 at 2.

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CLAIM 1	InterSense IS-900
	<div>  <p>InterSense IS-900 Systems</p> <p>Precision 6-DOF Motion Tracking</p> <ul style="list-style-type: none"> • <i>Interference free, wide area motion tracking for:</i> <ul style="list-style-type: none"> - Simulation and training systems - Immersive and Head Mounted Displays - CAVE^(tm)s, Power Walls, Reality Centers - Visualization Systems - Augmented and Mixed Reality Systems • <i>Flexible configuration options</i> • <i>Wireless tracked devices</i> • <i>SDK for OEM applications on Windows, Linux and IRIX platforms</i> • <i>Windows software provides simple configuration and network interface</i> </div> <p>InterSense IS-900 Ex. 3. Further, a POSITA would have known that estimation subsystem is configured to update a location estimate for the object based on configuration data and measurement information accepted from the sensor subsystem.</p> <p><i>See also Defendants' Invalidity Contentions for further discussion.</i></p>

B. DEPENDENT CLAIM 2

CLAIM 2	InterSense IS-900
[2] The system of claim 1 wherein the sensor subsystem includes one	At least under Plaintiffs' apparent infringement theory, InterSense IS-900 discloses, either expressly or inherently, the system of claim 1 wherein the sensor subsystem includes one or more sensor modules, each providing an interface for interacting with a corresponding set of one or more sensing elements. In the alternative, this element

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CLAIM 2	InterSense IS-900
<p>or more sensor modules, each providing an interface for interacting with a corresponding set of one or more sensing elements.</p>	<p>would be obvious over InterSense IS-900 in light of the other references disclosed in Defendants' Invalidity Contentions and/or the knowledge of one of ordinary skill in the art.</p> <p><i>See, e.g.:</i></p> <p>Brief Introduction & Synopsis of the Operation of the IS-900</p> <p>The InterSense IS-900 Motion Tracking System, commercially introduced in 1999, was developed in conjunction with a Navy SBIR program. To date, there are over 500 IS-900 systems in the field today with the majority of applications found in the military sector (flight simulators, weapon training systems, etc.), industry (oil & gas, automotive) and university research labs.</p> <p>The system is a 6 degree of freedom motion (6-DOF) tracking system based on a hybrid technology of inertia and ultrasonic tracking. The position and orientation of the tracking stations are determined by the output of the accelerometers and gyros. Drift correction is accomplished in our advanced kalman filter by fusing the output of the inertial sensors with range measurements obtained from the ultrasonic components. The result is full 6-DOF data that is very smooth, precise, and free from jitter.</p> <p>InterSense IS-900 Ex. 2 at 1.</p> <p>The tracking head determines the absolute position & orientation of the camera and combines this data with the zoom, focus and iris information for transmission to a rack mounted processor (Figure 4 - IS-900 Base Unit).</p>  <p>Figure 4 - IS-900 SCT Processor</p> <p><i>See Disclosures with respect to Claim 1, supra; see also Defendants' Invalidity Contentions for further discussion.</i></p>

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C. DEPENDENT CLAIM 3

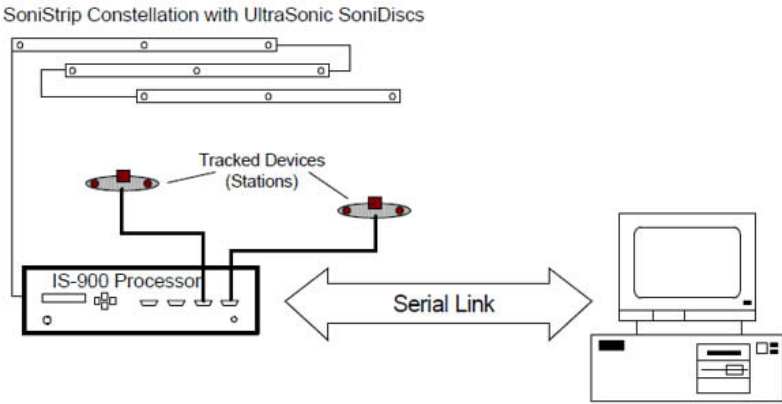

CLAIM 3	InterSense IS-900
<p>[3] The system of claim 2 wherein the interface enables the sensor module to perform computations independently of an implementation of the estimation subsystem.</p>	<p>At least under Plaintiffs' apparent infringement theory, InterSense IS-900 discloses, either expressly or inherently, the system of claim 2 wherein the interface enables the sensor module to perform computations independently of an implementation of the estimation subsystem. In the alternative, this element would be obvious over InterSense IS-900 in light of the other references disclosed in Defendants' Invalidity Contentions and/or the knowledge of one of ordinary skill in the art.</p> <p><i>See, e.g.:</i></p> <p>System Components & Configuration</p> <p>Figure 1 illustrates the configuration of the hybrid inertial-acoustic tracking system. The IS-900 hardware is made up of SoniStrips™, Tracked Devices or Stations, and the Processor Unit. The drawing illustrates the IS-900 being used to track two inertial/acoustic devices. The SoniStrip constellation transmits 40 kHz ultrasonic signals that are received by the tracked devices. The inertial component in the tracked station calculates orientation and position updates. The acoustic components prevent drift accumulation to provide full 6-DOF data sent out via an RS-232 connection.</p>  <p>Figure 1 – IS-900 HW diagram</p> <p>The IS-900 has expansion capability up to 4 tracked stations. Since each tracking station is pre-configured, your IS-900 automatically registers each station type and its physical connection to the IS-900 base processor upon power up. The IS-900 SoniStrips are designed for mounting above your tracked space in flexible configurations to allow use in a wide variety of large area tracked environments.</p>

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CLAIM 3	InterSense IS-900
	<p>IS-900 Processor</p> <p>The IS-900 Processor uses specialized firmware to control several independent microprocessors used throughout the system. Shown in Figure 2, the Processor has four front panel inputs for tracked stations, a front panel LCD status indicator, and four back panel SoniStrip hub connections (to support a total of 48 SoniDiscs). A SoniStrip Expansion hub can be added for additional SoniStrips</p>  <p style="text-align: center;">Figure 2 – IS-900 Processor</p> <p>InterSense IS-900 Ex. 2 at 2.</p> <p><i>See</i> Disclosures with respect to Claim 2, <i>supra</i>; <i>see also</i> Defendants’ Invalidity Contentions for further discussion.</p>

D. DEPENDENT CLAIM 4

CLAIM 4	InterSense IS-900
<p>[4] The system of claim 2 wherein the interface enables the estimation subsystem to perform computations independently of an implementation of the sensor modules.</p>	<p>At least under Plaintiffs’ apparent infringement theory, InterSense IS-900 discloses, either expressly or inherently, the system of claim 2 wherein the interface enables the estimation subsystem to perform computations independently of an implementation of the sensor modules. In the alternative, this element would be obvious over InterSense IS-900 in light of the other references disclosed in Defendants’ Invalidity Contentions and/or the knowledge of one of ordinary skill in the art.</p> <p><i>See, e.g.:</i></p>

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CLAIM 4	InterSense IS-900
	<p>Brief Introduction & Synopsis of the Operation of the IS-900</p> <p>The InterSense IS-900 Motion Tracking System, commercially introduced in 1999, was developed in conjunction with a Navy SBIR program. To date, there are over 500 IS-900 systems in the field today with the majority of applications found in the military sector (flight simulators, weapon training systems, etc.), industry (oil & gas, automotive) and university research labs.</p> <p>The system is a 6 degree of freedom motion (6-DOF) tracking system based on a hybrid technology of inertia and ultrasonic tracking. The position and orientation of the tracking stations are determined by the output of the accelerometers and gyros. Drift correction is accomplished in our advanced kalman filter by fusing the output of the inertial sensors with range measurements obtained from the ultrasonic components. The result is full 6-DOF data that is very smooth, precise, and free from jitter.</p> <p>InterSense IS-900 Ex. 2 at 1.</p> <p>The tracking head determines the absolute position & orientation of the camera and combines this data with the zoom, focus and iris information for transmission to a rack mounted processor (Figure 4 - IS-900 Base Unit).</p>  <p>Figure 4 - IS-900 SCT Processor</p>

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CLAIM 4	InterSense IS-900
	<p>The processor performs specialized Kalman filtering operations on the tracking data and provides output that is internally or externally synchronized to either standard video rates or any custom rate from under 24 fps up to 180 fps. The data formats and structure in the IS-900 is user programmable through a simple command line or script utility. This feature provides the flexibility needed to match input formats of virtual set software, 3D compositing systems, rendering packages, and real time simulators.</p> <p>InterSense IS-900 Ex. 4 at 2.</p> <p>See Disclosures with respect to Claim 2, <i>supra</i>; see also Defendants' Invalidity Contentions for further discussion.</p>

E. INDEPENDENT CLAIM 6

CLAIM 6	InterSense IS-900
<p>[6.pre] A method comprising:</p>	<p>At least under Plaintiffs' apparent infringement theory, InterSense IS-900 discloses, either expressly or inherently, a method. In the alternative, this element would be obvious over InterSense IS-900 in light of the other references disclosed in Defendants' Invalidity Contentions and/or the knowledge of one of ordinary skill in the art.</p> <p><i>See, e.g.:</i></p> <p>The IS-900 product line represents a breakthrough in precision motion tracking for all types of immersive 3D environments. Based on patent-pending Constellation™ technology and proprietary SensorFusion software, the IS-900 series consists of four application specific products that deliver precise and accurate wide-area, interference-free, head, hand and object tracking for the most demanding immersive graphics applications.</p> <p>The IS-900 architecture uses InterSense's SensorFusion software to combine the latest advances in inertial and ultrasonic tracking technology to deliver tracking resolution in the millimeter range for position and below a degree</p>

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CLAIM 6	InterSense IS-900
	<p>for orientation. Together, the hybrid solution achieves superior performance, resolution and robustness while virtually eliminating the drift, jitter and lag found in other motion tracking systems. The IS-900 features a modular Constellation architecture, which provides unlimited range, intelligent sensor networking for easy expansion and ergonomically designed hand-held stylus, joystick and integrated 3D glasses tracker for comfortable, high-performance head and hand tracking.</p> <p>"The IS-900 architecture series delivers the most precise, real-time, multi-point tracking on the market for even the most complex immersive graphics applications," Charlie Miller, president and CEO of InterSense, said.</p> <p>The IS-900 line also offers an easily installed system, auto-calibration hardware and software, and wide software support and backward compatibility with InterSense's present products. From CAVEs™, ImmersaDesks™ and PowerWalls™, to rooms, buildings and production studios, the IS-900 product line provides the ideal precision motion tracking solution for any immersive application.</p> <p>InterSense IS-900 Ex. 1.</p>

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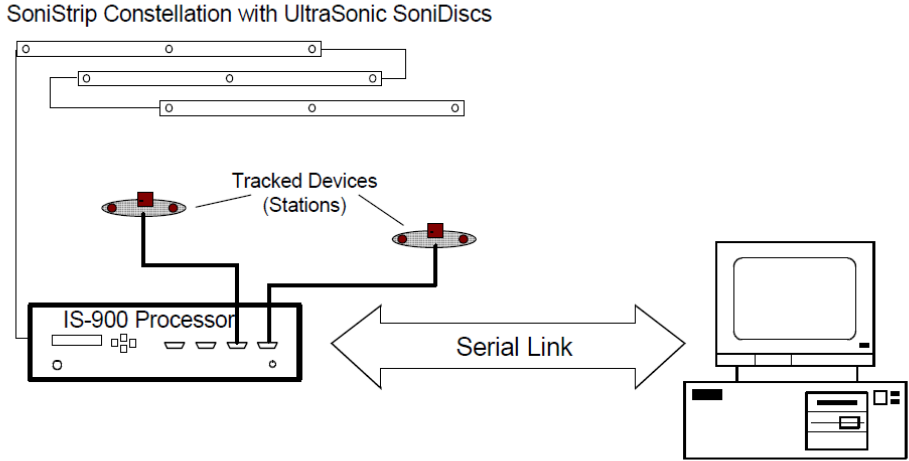

CLAIM 6	InterSense IS-900
	<p>System Components & Configuration</p> <p>Figure 1 illustrates the configuration of the hybrid inertial-acoustic tracking system. The IS-900 hardware is made up of SoniStrips™, Tracked Devices or Stations, and the Processor Unit. The drawing illustrates the IS-900 being used to track two inertial/acoustic devices. The SoniStrip constellation transmits 40 kHz ultrasonic signals that are received by the tracked devices. The inertial component in the tracked station calculates orientation and position updates. The acoustic components prevent drift accumulation to provide full 6-DOF data sent out via an RS-232 connection.</p>  <p style="text-align: center;">Figure 1 – IS-900 HW diagram</p> <p>InterSense IS-900 Ex. 2 at 2.</p>

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CLAIM 6

InterSense IS-900

InterSense IS-900 Systems



Precision 6-DOF Motion Tracking

- *Interference free, wide area motion tracking for:*
 - *Simulation and training systems*
 - *Immersive and Head Mounted Displays*
 - *CAVE^(tm)s, Power Walls, Reality Centers*
 - *Visualization Systems*
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- *Flexible configuration options*
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- *SDK for OEM applications on Windows, Linux and IRIX platforms*
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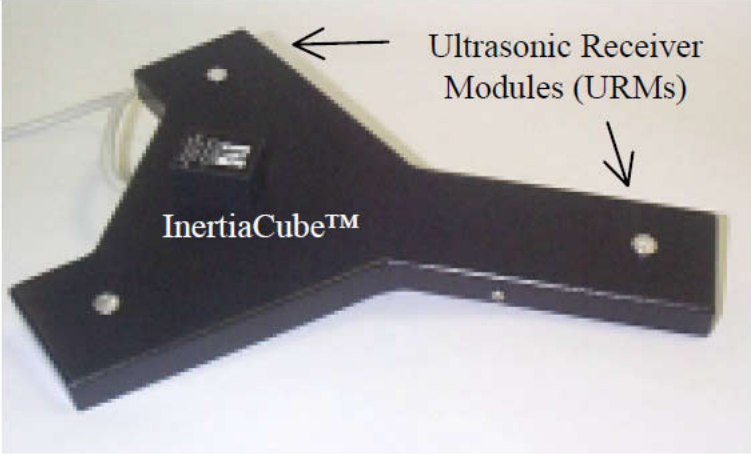
CLAIM 6	InterSense IS-900
	<p style="text-align: center;">Figure 1 – SoniStrips™</p> <p>To track the camera and its lens information, an integrated tracking head (Figure 2) mounted on a local camera rail system with lens encoders uses a miniaturized inertial sensor (Figure 3) fused in firmware with a set of three ultrasonic receiver modules (URMs).</p>  <p style="text-align: center;">Figure 2 - Inertial/Acoustic Tracking Head</p> <p>InterSense IS-900 Ex. 4 at 2.</p> <p><i>See Disclosures with respect to Claim 1, supra; see also Defendants' Invalidity Contentions for further discussion.</i></p>
[6.a] enumerating sensing elements available to a tracking system that includes an estimation subsystem	At least under Plaintiffs' apparent infringement theory, InterSense IS-900 discloses, either expressly or inherently, enumerating sensing elements available to a tracking system that includes an estimation subsystem that estimates a position or orientation of an object. In the alternative, this element would be obvious over InterSense IS-900 in

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CLAIM 6	InterSense IS-900																																												
that estimates a position or orientation of an object; and	<p>light of the other references disclosed in Defendants’ Invalidity Contentions and/or the knowledge of one of ordinary skill in the art.</p> <p>See, e.g.:</p> <p>The IS-900 architecture uses InterSense's SensorFusion software to combine the latest advances in inertial and ultrasonic tracking technology to deliver tracking resolution in the millimeter range for position and below a degree for orientation. Together, the hybrid solution achieves superior performance, resolution and robustness while virtually eliminating the drift, jitter and lag found in other motion tracking systems. The IS-900 features a modular Constellation architecture, which provides unlimited range, intelligent sensor networking for easy expansion and ergonomically designed hand-held stylus, joystick and integrated 3D glasses tracker for comfortable, high-performance head and hand tracking.</p> <p>"The IS-900 architecture series delivers the most precise, real-time, multi-point tracking on the market for even the most complex immersive graphics applications," Charlie Miller, president and CEO of InterSense, said.</p> <p>InterSense IS-900 Ex. 1.</p> <div><div>IS-900 Product Configurations</div><table><tr><th>Product Features</th><th>IS-900 SimTracker</th><th>IS-900 VWT</th><th>IS-900 VET</th></tr><tr><td>Standard Tracking Volume</td><td>1.5 x 1.5 x 2.0 m</td><td>2.0 x 1.5 x 3.0 m</td><td>3.0 x 3.0 x 3.0 m</td></tr><tr><td>Maximum Tracking Area</td><td>20 m²</td><td>20 m²</td><td>72 m²</td></tr><tr><td>Maximum SoniStrips</td><td>12</td><td>12</td><td>48</td></tr><tr><td>Maximum Tracked Devices</td><td>4 MiniTrax Trackers</td><td>4 MiniTrax Trackers</td><td>4 MiniTrax Trackers</td></tr><tr><td>Upgradable to Wireless</td><td>Yes</td><td>Yes</td><td>Yes</td></tr><tr><td colspan="4">Standard Components</td></tr><tr><td>Processor</td><td>IS-900 VWT</td><td>IS-900 VWT</td><td>IS-900 VET</td></tr><tr><td>Tracked Device(s)</td><td>MiniTrax Head Tracking Station</td><td>MiniTrax Head Tracking Station</td><td>MiniTrax Head Tracking Station</td></tr><tr><td></td><td></td><td>Tracked Wand w/ Buttons & Joystick</td><td>Tracked Wand w/ Buttons & Joystick</td></tr><tr><td>Position Referencing Constellation</td><td>SoniWing</td><td>4 SoniStrips</td><td>6 SoniStrips</td></tr></table></div> <p>InterSense IS-900 Ex. 3.</p>	Product Features	IS-900 SimTracker	IS-900 VWT	IS-900 VET	Standard Tracking Volume	1.5 x 1.5 x 2.0 m	2.0 x 1.5 x 3.0 m	3.0 x 3.0 x 3.0 m	Maximum Tracking Area	20 m²	20 m²	72 m²	Maximum SoniStrips	12	12	48	Maximum Tracked Devices	4 MiniTrax Trackers	4 MiniTrax Trackers	4 MiniTrax Trackers	Upgradable to Wireless	Yes	Yes	Yes	Standard Components				Processor	IS-900 VWT	IS-900 VWT	IS-900 VET	Tracked Device(s)	MiniTrax Head Tracking Station	MiniTrax Head Tracking Station	MiniTrax Head Tracking Station			Tracked Wand w/ Buttons & Joystick	Tracked Wand w/ Buttons & Joystick	Position Referencing Constellation	SoniWing	4 SoniStrips	6 SoniStrips
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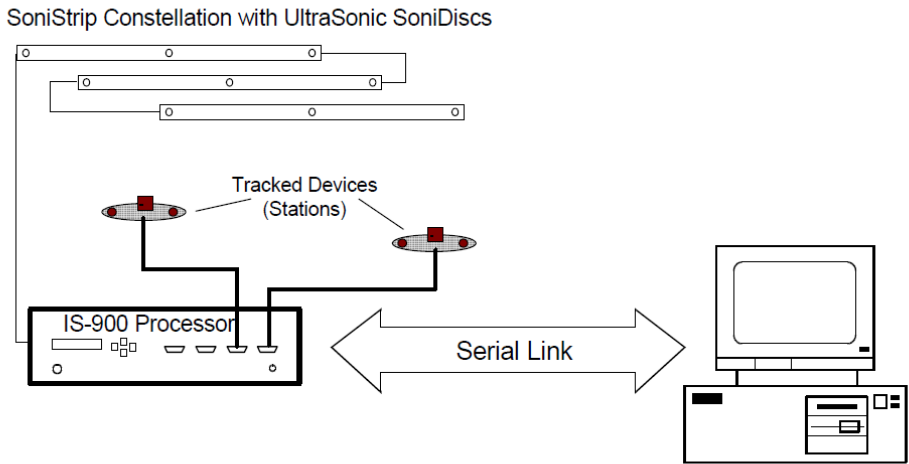
CLAIM 6	InterSense IS-900
	<p>System Components & Configuration</p> <p>Figure 1 illustrates the configuration of the hybrid inertial-acoustic tracking system. The IS-900 hardware is made up of SoniStrips™, Tracked Devices or Stations, and the Processor Unit. The drawing illustrates the IS-900 being used to track two inertial/acoustic devices. The SoniStrip constellation transmits 40 kHz ultrasonic signals that are received by the tracked devices. The inertial component in the tracked station calculates orientation and position updates. The acoustic components prevent drift accumulation to provide full 6-DOF data sent out via an RS-232 connection.</p>  <p style="text-align: center;">Figure 1 – IS-900 HW diagram</p> <p>InterSense IS-900 Ex. 2 at 2.</p>

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CLAIM 6	InterSense IS-900
	<p>Brief Introduction & Synopsis of the Operation of the IS-900</p> <p>The InterSense IS-900 Motion Tracking System, commercially introduced in 1999, was developed in conjunction with a Navy SBIR program. To date, there are over 500 IS-900 systems in the field today with the majority of applications found in the military sector (flight simulators, weapon training systems, etc.), industry (oil & gas, automotive) and university research labs.</p> <p>The system is a 6 degree of freedom motion (6-DOF) tracking system based on a hybrid technology of inertia and ultrasonic tracking. The position and orientation of the tracking stations are determined by the output of the accelerometers and gyros. Drift correction is accomplished in our advanced kalman filter by fusing the output of the inertial sensors with range measurements obtained from the ultrasonic components. The result is full 6-DOF data that is very smooth, precise, and free from jitter.</p> <p>InterSense IS-900 Ex. 2 at 1.</p> <p>The tracking head determines the absolute position & orientation of the camera and combines this data with the zoom, focus and iris information for transmission to a rack mounted processor (Figure 4 - IS-900 Base Unit).</p>  <p>Figure 4 - IS-900 SCT Processor</p> <p>InterSense IS-900 Ex. 4 at 2.</p> <p><i>See Disclosures with respect to Claim 1, supra; see also Defendants' Invalidity Contentions for further discussion.</i></p>
[6.b] providing parameters specific to the enumerated sensing	At least under Plaintiffs' apparent infringement theory, InterSense IS-900 discloses, either expressly or inherently, providing parameters specific to the enumerated sensing elements to the tracking system to enable the estimation subsystem to be configured based on the parameters specific to the enumerated sensing elements to enable the

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CLAIM 6	InterSense IS-900
<p>elements to the tracking system to enable the estimation subsystem to be configured based on the parameters specific to the enumerated sensing elements to enable the estimation subsystem to estimate the position or orientation of the object.</p>	<p>estimation subsystem to estimate the position or orientation of the object. In the alternative, this element would be obvious over InterSense IS-900 in light of the other references disclosed in Defendants' Invalidity Contentions and/or the knowledge of one of ordinary skill in the art.</p> <p><i>See, e.g.:</i></p> <p>Brief Introduction & Synopsis of the Operation of the IS-900</p> <p>The InterSense IS-900 Motion Tracking System, commercially introduced in 1999, was developed in conjunction with a Navy SBIR program. To date, there are over 500 IS-900 systems in the field today with the majority of applications found in the military sector (flight simulators, weapon training systems, etc.), industry (oil & gas, automotive) and university research labs.</p> <p>The system is a 6 degree of freedom motion (6-DOF) tracking system based on a hybrid technology of inertia and ultrasonic tracking. The position and orientation of the tracking stations are determined by the output of the accelerometers and gyros. Drift correction is accomplished in our advanced kalman filter by fusing the output of the inertial sensors with range measurements obtained from the ultrasonic components. The result is full 6-DOF data that is very smooth, precise, and free from jitter.</p> <p>InterSense IS-900 Ex. 2 at 1.</p> <p>The tracking head determines the absolute position & orientation of the camera and combines this data with the zoom, focus and iris information for transmission to a rack mounted processor (Figure 4 - IS-900 Base Unit).</p>  <p>Figure 4 - IS-900 SCT Processor</p> <p>InterSense IS-900 Ex. 4 at 2.</p>

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CLAIM 6	InterSense IS-900
	<i>See</i> Disclosures with respect to Claim 1, <i>supra</i> ; <i>see also</i> Defendants' Invalidity Contentions for further discussion.

F. DEPENDENT CLAIM 8

CLAIM 8	InterSense IS-900
<p>[8] The method of claim 6 wherein the set of sensing elements comprises at least one sensor and at least one target, the sensor making a measurement with respect to the target.</p>	<p>At least under Plaintiffs' apparent infringement theory, InterSense IS-900 discloses, either expressly or inherently, the method of claim 6 wherein the set of sensing elements comprises at least one sensor and at least one target, the sensor making a measurement with respect to the target. In the alternative, this element would be obvious over InterSense IS-900 in light of the other references disclosed in Defendants' Invalidity Contentions and/or the knowledge of one of ordinary skill in the art.</p> <p><i>See, e.g.:</i></p> <p>The IS-900 architecture uses InterSense's SensorFusion software to combine the latest advances in inertial and ultrasonic tracking technology to deliver tracking resolution in the millimeter range for position and below a degree for orientation. Together, the hybrid solution achieves superior performance, resolution and robustness while virtually eliminating the drift, jitter and lag found in other motion tracking systems. The IS-900 features a modular Constellation architecture, which provides unlimited range, intelligent sensor networking for easy expansion and ergonomically designed hand-held stylus, joystick and integrated 3D glasses tracker for comfortable, high-performance head and hand tracking.</p> <p>"The IS-900 architecture series delivers the most precise, real-time, multi-point tracking on the market for even the most complex immersive graphics applications," Charlie Miller, president and CEO of InterSense, said.</p> <p>InterSense IS-900 Ex. 1.</p>

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G. DEPENDENT CLAIM 9

CLAIM 9	InterSense IS-900
<p>[9] The method of claim 8 wherein the target comprises a natural feature in an environment.</p>	<p>At least under Plaintiffs' apparent infringement theory, InterSense IS-900 discloses, either expressly or inherently, the method of claim 8 wherein the target comprises a natural feature in an environment. In the alternative, this element would be obvious over InterSense IS-900 in light of the other references disclosed in Defendants' Invalidity Contentions and/or the knowledge of one of ordinary skill in the art.</p> <p><i>See, e.g.:</i></p>

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CLAIM 9	InterSense IS-900
	<p>Tracking systems are being installed in a wide variety of environments including large spaces for studio, museum and entertainment applications down to small cockpit or desktop environments for flight simulators, design workstations or virtual training applications.</p> <p>While the SoniStrip array addresses most standard immersive display applications, a modular approach to the ultrasonic array is desired to cover a larger range of tracking applications. With a typical installation of SoniStrips in a large room environment, the SoniStrips are mounted in a grid pattern on the ceiling, spaced roughly 1 meter apart. Once installed, the full array is measured with an optical sighting tool (“Total Station”) to determine the exact location of each beacon. These measured coordinates are downloaded into the IS-900 processor to establish a tracking constellation reference for the environment.</p> <p>InterSense IS-900 Ex. 2 at 9.</p> <p><i>See</i> Disclosures with respect to Claim 8, <i>supra</i>; <i>see also</i> Defendants’ Invalidity Contentions for further discussion.</p>